Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A method for optically inspecting a sample, the method comprising:

illuminating the sample with an incident field and obtaining a resulting output field;

measuring the resulting output field to determine an optical response of the sample;

generating measurement parameters that correspond to the measured optical response by performing the following operations:

a) searching a database to locate a pre-computed optical response that most closely matches the determined optical response, ~~and associated measurement parameters,~~

b) interpolating based on the pre-computed optical response to generate an interpolated optical response that matches the determined optical response within a first defined termination criterion, and ~~between pre-computed responses in the database to generate an interpolated optical response and associated measurement parameters, and~~

c) iteratively evaluating a theoretical model to refine the interpolated optical response until the refined interpolated optical response matches the determined optical response within a second defined termination criterion and determining the ~~generate a theoretical optical response and associated~~ measurement parameters therefrom.

2. (Original) A method as recited in claim 1 that further comprises the step of iteratively evaluating the theoretical model to generate the database.

3. (Original) A method as recited in claim 1 wherein the step of interpolating is performed without evaluating the theoretical model.

4. (Currently Amended) A method as recited in claim 1 wherein the database searching, database interpolation and [[model]] iterative evaluation operations are performed in sequence to successively refine an optical response and ~~associated~~ determine the measurement parameters.

5. (Original) A method as recited in claim 1 wherein the database interpolation is performed using reduced multicubic interpolation.

6. (Original) A method as recited in claim 1 wherein the operations a, b and c are performed in order.

7. (Currently Amended) A device for optically inspecting a sample, the device comprising:

a measurement system for illuminating the sample with an incident field and generating a resulting output field, the measurement system operable to measure ~~and measuring~~ the resulting output field to determine an optical response of the sample;

a processor for generating measurement parameters that correspond to the measured optical response, the processor configured to include:

a database searching module for searching a database to locate a pre-computed optical response; ~~and associated measurement parameters~~

a interpolated refinement module for interpolating based on the pre-computed optical response to generate an interpolated optical response that more closely matches the determined optical response; and ~~between pre-computed responses in the database to generate an interpolated optical response and associated measurement parameters; and~~

a theoretical refinement module for iteratively refining the interpolated optical response ~~evaluating a theoretical model to generate a theoretical optical response~~ and ~~associated~~ determining the measurement parameters therefrom.

8. (Currently Amended) A device as recited in claim 7 wherein the database is generated by iteratively evaluating the theoretical refinement model.

9. (Currently Amended) A device as recited in claim 7 wherein the interpolated refinement module operates without evaluating the theoretical refinement model.

10. (Currently Amended) A device as recited in claim 7 wherein the database searching, database interpolation and [[model]] iterative evaluation operations are invoke in sequence to successively refine an optical response and ~~associated~~ determine the measurement parameters.

11. (Currently Amended) A method of evaluating a sample comprising the steps of: ~~A device as recited in claim 7 wherein the database interpolation is performed using reduced multicubic interpolation.~~

illuminating the sample with an incident field;

measuring the resulting output field to determine a measured optical response of the sample;

searching within a database of pre-computed optical responses and associated measurement parameters to locate the pre-computed optical response that most closely matches the measured optical response;

interpolating ~~within the database~~ to refine the pre-computed optical response obtained from the database to more closely match the measured optical response; and

iteratively evaluating a theoretical model to refine the optical response obtained by interpolation to more closely match the measured optical response.

12. (Original) A method as recited in claim 11 that further comprises the step of iteratively evaluating the theoretical model to generate the database.

13. (Original) A method as recited in claim 11 wherein the step of interpolating is performed without evaluating the theoretical model.

14. (Original) A method as recited in claim 11 wherein the database interpolation is performed using reduced multicubic interpolation.

15. (Currently Amended) A method of evaluating a sample comprising the steps of:

creating a database of pre-computed optical responses and pre-computed ~~associated~~ measurement parameters of the sample;

optically inspecting the sample to generate an empirical optical response;

comparing the empirical optical response to the ~~theoretical~~ pre-computed optical responses stored in the database and selecting the closest match;

using the closest match, interpolating ~~between pre-computed responses in the database~~ to generate an interpolated optical response; and ~~associated measurement parameters~~; and

using the interpolated optical response ~~and associated measurement parameters~~ as a starting point, iteratively evaluating a theoretical model corresponding to the sample to minimize the difference between theoretically generated optical responses and the empirical optical response to produce a best fit for the actual measurement parameters of the sample.

16. (Original) A method as recited in claim 15 that further comprises the step of iteratively evaluating the theoretical model to generate the database.

17. (Original) A method as recited in claim 15 wherein the interpolated optical response is generated without evaluating the theoretical model.

18. (Original) A method as recited in claim 15 wherein the interpolated optical response is generated using reduced multicubic interpolation.